Experimence: Considerations for Composing a Rock Song for Interactive Audience Participation

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Experimence: Considerations for Composing a Rock Song for Interactive Audience Participation

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ABSTRACT

In popular music genres, typical songs are pre-composed and leave little or no space for improvisation during a live performance. That applies for the performing musicians as well as for the spectators in terms of interactive audience participation. In this study we question these improvisational limits and try to identify strategies for involving the audience as an additional and unpredictable factor in a pre-composed rock song. To do so we composed "Experimence" guided by the standard practice of song writing. The song was premiered at a public live concert where the audience could collaboratively participate in real-time by playing with a balloon together throughout the song. Using a wizard of oz technique, the movements of the balloon influenced the live music played by the pianist. We reflect across this experience and present notable issues raised during the composition, rehearsals and the actual performance. We then classify these aspects as abstract variables of consideration for a composition meant to promote such audience participation. We propose this proof of concept as a starting point for further discussion, suggesting that a song such as Experimence can be a unique and individual piece of music every time it is played although largely pre-composed.

1. INTRODUCTION

In this paper we take popular music as a starting point for a live music study that incorporates audience participation. In particular we present two intertwined elements that come together a live performance: (1) the composition of a rock song "Experimence"[1] that was created with participation in mind, and (2) the inclusion of the audience in a performance via collaborative interaction. Both have been created in parallel and influenced each other during different stages of the composition, rehearsal and performance process.

This approach originated from the idea to develop a versatile and engaging concept for interactive audience participation which includes all spectators. Unlike other interventions exploring audience participation, no additional technical devices such as mobile phones (e.g. [2], [3]) or other purpose-built gadgets (e.g. [4]) are needed by the audience to take part in the performance. The only artefact which is necessary and subject to interaction is a balloon which is bounced around by the spectators as shown in Figure 1 and influences the music by its trajectory.

Figure 1. Balloon in the audience.

In this paper we focus on the song itself and its creation in the context of an anticipated audience participation at the live performance. The choice of the actual intervention was highly motivated by other similar approaches in research and art [5, 6, 7, 8]. In particular we reflect on the process of the composition and the musical output during the performance. A self-imposed constraint was that the musical piece should be a rock song, composed following typical practices regarding song writing as inspired by literature (e.g. [9]) and the artists' experience.

This approach allowed us to join up two extremes: (1) the pre-defined limitations and conventions regarding the composition within this genre, and (2) the largely unpredictable and open influence of the audience within an interactive experience. Hence, the research questions we want to elaborate with this study are: Which aspects have to be considered when composing a rock song while keeping in mind interactive audience participation during its live performance? How can these aspects be classified in terms of variability during their application in the process of the composition?

By answering these questions we reflect on the iterative process of composition, rehearsal and the final live performance. The latter happened at a music festival which gave

us the chance to study it with a diverse and unprepared audience. The whole performance was video-recorded from four different angles. Additionally we took notes of decisions and practices during the composition and rehearsals. All this data helped us to analyse the whole process retrospectively.

The results indicate that even a structured and largely pre-composed song leaves a certain amount of space for unforeseeable musical events as can happen with an independent crowd and interactive participation. Furthermore, we extract variables of influence from our reflection on the whole process. These variables, along with the actual song Experimence and the intervention itself, constitute our main contribution.

We will proceed with an analysis of related work within the field of audience participation and of song writing before describing the composition, rehearsal and live performance experiences in detail. Finally the discussion of the collected data will be completed with the conclusion we draw from this study.

2. RELATED WORK

Audience participation during the live performance of popular music is a common method to engage the crowd and actively include spectators in the show. More than 200 years ago, Mozart was one of the first who tried to make his music, which can be considered as popular in those times, interactive for the audience. He let people participate by rolling dice and thereby rearrange bars of the composition in his piece "Das musikalische Würfelspiel" [10, 11].

Nowadays artists on stage widely use the practice to motivate and guide the audience to sing certain parts of a song or even let single persons in front rows sing a couple of tunes through the singer's microphone to involve their fans. Making spectators literally an active part of the show by getting them on stage to perform a song spontaneously together have been done by several artists already [12].

Not directly related to music but nevertheless an approach to become an active part of a live concert, many audiences throughout time have used their lighters to illuminate concert halls together. This behaviour has been adapted for a recent commercial product called Xylobands [13]. With these radio controlled and colour changing wristbands each spectator, even in huge audiences, can be visually included in a show.

This leads to interactive audience participation for live music supported by technology, which is also the basis of this study. In 1992, the band D'Cückoo invented the MIDIBall, a "gigantic beach ball that creates music as the audience bats it around" by using MIDI and wireless radio technology [5]. Later in 2002, this idea was adapted by Maynes-Aminzade et al. to study techniques for interactive crowd activities [7]. Both works inspired us to revisit this approach for our own purposes.

Information about the crowd in a music related context has been collected in various ways. For example, Freeman wrote a special composition for chamber orchestra and audience called "Glimmer" where the audience used light sticks to collaboratively create instructions for the musicians [4]. Researchers in nightclubs used biofeedback of the audience for an automated DJ [14] and carried out studies on DJ-audience interaction [15].

Mobile phones have been subject to audience participation in live music since they become popular and everyone carries them around. An early work within this domain was Levin's "Dialtones" in 2001 where he used the audience to collaboratively create a concert by using their mobile phones for dialing and ringing [16]. Later mobile technologies where applied increasingly in various different ways as they allow the use of biofeedback [17] or embodied gestures [2, 3, 18, 19].

Song writing and the analysis of popular music and in particular rock music has been subject to a lot of studies. According to Lamb the definition of popular music is "purposefully flexible" as the music it defines is "constantly changing" [20]. He continues that one definition might be "music that evolved out of the rock 'n' roll revolution of the mid-1950's". However, a clear definition is not subject of this paper and would go beyond its scope.

Nevertheless we took different studies dealing with popular music as a starting point and guideline for our own composition. A general analysis of this huge and diverse genre of music was presented by Tagg, including a model to characterise different forms of music [9] (p.42).

Focusing on rock music, Baugh elaborates its aesthetics but leaves out the question "what makes a good rock song?" for good reasons by raising a set of different questions e.g. addressing the compositional form [21]. Following this path we took Burns' "Typology of 'Hooks' in Popular Records" [22] and Covach's "Form in Rock Music" [23] as inspirational guidelines.

By the combination of suggestions made in literature, with the diverse experience and creativity of involved musicians (to be introduced in section 4.1), we worked hard to compose a good rock song. This was important since the song was to be used for a live performance with interactive audience participation. The ultimate aim was to study the issues that arise when merging the unpredictable behaviour of a big crowd with a largely pre-composed rock song.

We now proceed with a description of the composition and the accompanying considerations during this creative process.

3. COMPOSITION

The composition of the song, which was given the title "Experimence", was purpose-written for this particular study mainly by the first author of this paper. Many different considerations regarding arrangement, form, harmony and lyrics, just to mention some important ones, shaped the final version as it was played during the live performance. These are described in the following and we return to them in the Discussion to reflect on them after the presentation of the results from the live performance. This analysis is based on self-reflection and notes that were taken during the composition and rehearsals.

In general the music and lyrics of Experimence were not intended to be just created as a song for the study but rep-

resent the main idea and purpose of it. A core idea for the interactive component of the study was that a balloon is to be collaboratively played with by the audience. This approach, to distribute balloons in the venue, has already been used by several artists such as Muse [6] or Coldplay [8] to successfully entertain the audience during their shows. The typical wave-like trajectory of a balloon being bounced around was taken up as guiding theme for the music. This particular characteristic of a balloon, to rise up fast when being pushed and to fall down slowly, is reflected figuratively at certain different levels within the whole song as described in each of the following sections.

To get an idea of the song and to support the understanding of the theory behind it, a live recording of the performance at the music festival "Wiener Musik-Experimente" (Viennese Music-Experiments) is available online, providing a video including the live music as well as different camera angles of the audience and performers [1]. We recommend to watch the video and listen to the song before proceeding.

3.1 Arrangement

Originally the piece was arranged for vocals, piano, guitar and drums. This instrumentation or parts thereof are widely used throughout popular music.

We chose the piano as lead instrument and central element for the audience participation. The main reason for this decision was to provide a clear distinction between the typical piano sound without influence in contrast to significant audible changes when including the crowd of spectators.

While working on initial harmony studies for the verse and according to the main intention of reflecting the balloon's trajectory figuratively in the music, Experimence turned out to become a slower ballad-like song with a 4/4 rhythm at a tempo of 90 beats per minute. However, the chorus did not feel right with a slow tempo (the balloon falling) and so it became the "balloon rises up fast"-part of the song, creating a speedy sung melody along with a tight rhythm in the piano accompaniment.

Apart from the piano, which carries the whole song, the other instruments appear and disappear throughout its progression. The climaxes and full arrangements always happen with a chorus, while the verses and interludes are the calming parts though still with continuous escalations. This leads directly to the actual form of the song which is described as following.

3.2 Form

From an analytical point of view and according to Covach, Experimence has a Verse-Chorus Form [23] though significantly extended. Usually this means the verse is mainly preparing and leading to the chorus, which is clearly the intentional and musical focus in this song form.

However, finding the final form which is presented in Table 1, was a key issue and aspect that changed most throughout the composition and the rehearsals.

In the first version of the song, the four Interludes were not considered at all and an instrumental solo part was planned instead of the third Chorus. At this point it is important to mention that the audience was intended to be included throughout the whole song influencing the sound of the piano. Hence, the first version represented a typical Verse-Chorus Form [23].

00:00-00:12	Intro	4 mm. (4a)
00:13-00:57	Verse	16 mm. (4a+4a+4b+4c)
00:58-01:22	Interlude 16th	8 mm. (4b+4b)
01:23-01:39	Chorus	6 mm. (6e)
01:40-02:21	Verse	16 mm.
02:22-02:37	Chorus	6 mm.
02:38-02:59	Interlude 16th	8 mm. (4a+4d)
03:00-03:15	Chorus	6 mm.
03:16-03:37	Interlude Solo	8 mm. (4b+4b)
03:38-03:53	Chorus	6 mm.
03:54-04:16	Interlude Outro	8 mm. (4b+4b+I)

Table 1. Final form of Experimence showing all parts and their duration in time, measures and a reference to the harmonies in Table 2.

In the first rehearsal of the song with the band, described in detail in section 4.2, we included a simulation of the anticipated participation of the audience. However, after a reflection by the band, two important decisions were made for aesthetic reasons mainly. First, it is not expedient to include the audience throughout the whole song, and second, as a consequence, it was decided to extend the first form by adding the Interludes specially tailored for the inclusion of the spectators.

The final version of Experimence for the live performance was still different from the actual performance [1]. In particular the Interlude "Solo" and the following last and fourth occurrence of the Chorus as shown in Table 1 were added by the musicians spontaneously during the live performance which is described in section 5.

3.3 Harmony

Creating the harmonic structures of Experimence was driven more by creativity than rationality. Nevertheless there were decisions made for specific reasons.

The harmonies reflect the idea of the balloon's trajectory in two ways. First, in the Introduction, Verses and Interludes, the piano uses stepwise chord progressions. An example is starting from C downwards to Dm following the major scale of C and up again to G as shown in Table 2, lines 4a. Slightly different variations of this progression are used throughout the song in all parts except the Chorus.

The second occurrence of the harmonic trajectory-imitation appears in the melody of the Interlude, which is played instrumentally by the piano. This series of 16th is shown in Figure 2 as score and MIDI notes in a piano roll view which visualises best the wave-like progression.

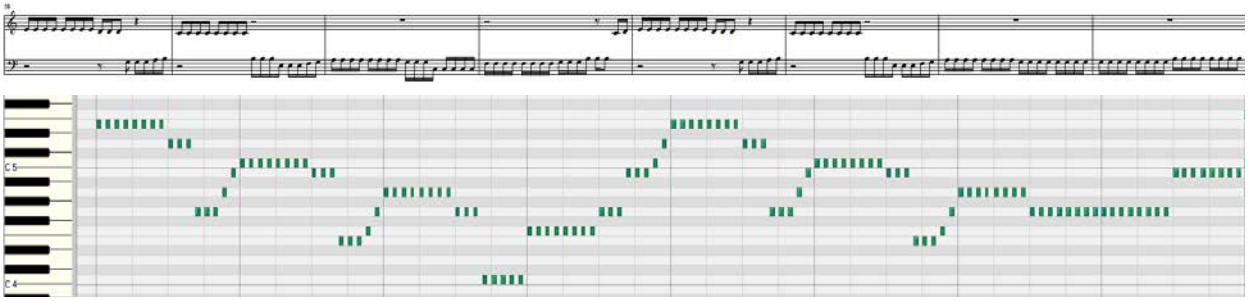

Figure 2. The melody of the second Interlude as notes and MIDI piano roll showing the wave-like progression.

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Introduction, Verse and Interlude:

4a: C  G/H   | Am  Am/G | F   Em  | Dm  G
4a: I  V/VII | vi  vi/V | IV  iii | ii  V

4b: C  G/H   | Am  Am/G | F       | (Gsus) G
4b: I  V/VII | vi  vi/V | IV      | (Vsus) V

4c: C  G/H   | Am  Fm/G# | Fmaj7  | Gsus G
4c: I  V/VII | vi  iv/V# | IVmaj7 | Vsus V

4d: C  G/H   | Am   Em  | F   C   | G
4d: I  V/VII | vi   iii | IV  I   | V

Chorus:

6e: F  G | Am  | F   G | E   Am G | F   | G
6e: IV V | vi  | IV  V | III vi V | IV  | V
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Table 2. Harmonies used in each part of Experimence as referenced in Table 1. Each single part is presented in two lines with corresponding notations: in actual chords and in scale-step.

After the analysis of the music-related elements of Experimence we proceed with the description and interpretation of the textual meaning.

3.4 Title and Lyrics

In an early stage it became clear that the lyrics should be somehow related to the purpose of the song rather than addressing something random. At this time the piece was given the title "Experimence". This artificial word combines the unique "Experience" everyone will have during the "Experiment" of its live performance.

The content of Experimence can be described as what both science and art have in common and try to explore: the quest for something new and to find the unexpected. In the song, the Verse, as written below, represents the wise and learned voice of a scholar or an experienced person. The Chorus though is either the sudden confession of this person's self-criticism or the preceding self-awareness before the conclusion. At the end of each Chorus the redefinition of one's own state of mind is presented as possible solution.

In either way, the content refers to the purpose of the song itself, which is an art-based and experimental approach to explore something unexpected.

Verse:
Hold on again some ways are fallacious
Find your own lane and mind those of others
Challenge the known will just guide us to new worlds
Life teaches well what happens if you do so

Chorus:
I started to explore the world
To look upon the rationale
And figured out it's endlessly
I started to imagine why
The edge of human knowledge could be
Worth a look beyond the scenery and
Redefined my state of mind

The original intention was to write two different verses. But we were unable to finish the second verse in time and to our full satisfaction due to the already scheduled festival. As such, there is just one verse in the current version of the song, and the two verses in the live performance are identical. This finalisation of verses will be subject to improvements for future studies.

4. REHEARSALS

Two rehearsals with the band led to significant changes regarding the form of the song and the final realisation of the interactive audience participation. These modifications and the band's orchestration are described in the following as well as the simulation of the anticipated crowds' behaviour that was used for a realistic performance rehearsal.

4.1 The Band

The whole study was planned as a project to be conducted together with a band especially formed by the first author whose alias is "Oliver Linus", the name also given to the band.

To rely on diverse experience in rock music, a professional drummer aged 35 and a hobby guitarist aged 58 were hired for the live performances. Both had played a vast number of performances and gained compositional experience in writing and recording popular music. None of the musicians had previously played together. The choice was not a coincidence, since the guitarist grew up with rock music starting in the 1960s and the drummer as well as the

Figure 3. The band "Oliver Linus" performing Experimence live.

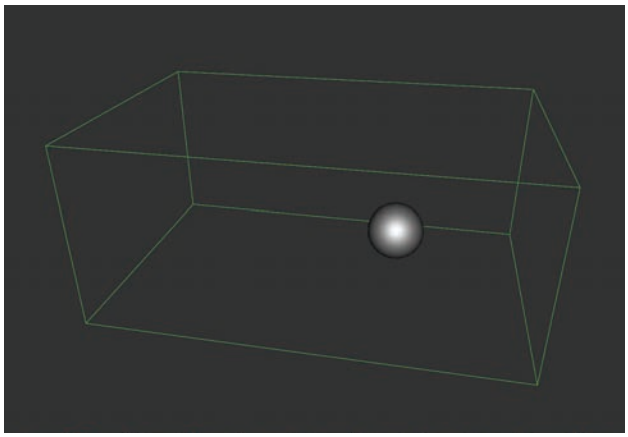

Figure 4. The simulation's visualisation of the balloon being moved around a room.

first author are familiar with more recent rock music. Figure 3 illustrates the musicians on stage performing Experimence. The singer and pianist is on the left, the guitarist is standing in the center and the drummer is on the right.

4.2 Simulation

Apart from an extensive rehearsal of the song Experimence for the purpose of a good live performance, an important issue was the simulation of the anticipated influence of the audience. This was especially important since this idea was new for the hired musicians.

To maximise a realistic practice of the song and support the imagination of how it could sound in an interactive performance, we developed a simple simulation of a balloon's trajectory in a room. A visualisation of this concept is shown in Figure 4. This real-time animation was also used during the rehearsals on a screen for all musicians to at least get a simplified idea of how the balloon might be flung around by the audience during the live performance.

The simulation itself is based on three values for the position of the balloon in the room (x, y, z) and one value for its the acceleration (v). These four values are created randomly to describe a changing trajectory. For the purpose of an almost realistic situation during the rehearsal this random approximation was sufficient.

4.3 Audience Influence

The rehearsals proved to be decisive in terms of the final influence of the audience in the song. The original idea was that the audience's interaction with the balloon would collaboratively modulate the sound of the piano by using additional effect devices.

However, when probing this approach in the first rehearsal using the simulation, it turned out that this alteration was too intense for the whole song and became even distracting and annoying somehow for the musicians. To address this, the Interludes were inserted into the song's structure as central elements for audience participation. This has been described in detail in chapter 3.2 already.

In the second rehearsal the idea arose to not only let the audience control the sound but the actual tunes of the Interludes. It was found this could work by mapping the trajectory of the balloon to a particular scale according to the Interlude's harmonies. However, two musicians voted against the last minute implementation of this idea mainly due to time constraints and so as not to introduce too much complexity at once.

Technically, the sound modulation was realised by using the effect device KaossPad [1] . To remotely control the KaossPad with the balloon tracking, we used Max/MSP [2] . In terms of mapping the position of the balloon in the room to effect parameters, we controlled the touch pad of the KaossPad with the two-dimensional position (left, right, front, back) and the intensity of the applied effect with the height in the room.

Focusing on the sound effect, we used a chorus for the first two Interludes and a vocoder for the other two ones. The chorus, which modulates a tone as if it would float in the room, was less intense compared to the vocoder which alienates the piano melody to a larger extent. This makes the influence clearly traceable without changing the piano sound too much.

4.4 Balloon Tracking

A technical realisation of the balloon tracking was not the aim of this study, rather it was to serve as a proof of concept and to study the compositional issues. Hence, we developed a concept for a Wizard-of-Oz-Experiment [24]. By doing so everything was designed for a real object tracking system with mounted video cameras, except for the manual tracking of the balloon. This was done behind the scenes by another person involved in the study and the only one apart from the lead author/composer who was informed about this concept. In fact even the hired musicians were not aware of the manual tracking. The balloon itself had a diameter of approximately 60 cm when inflated and was made of stronger rubber than a usual balloon product.

Finally, this allowed us to create a realistic scenario for our study at the live concert and to use it as a proof of concept. At the same time we could minimize the technical effort such a system would implicate to be reliable and ap-

[1] http://www.korg.com/us/products/dj/kaoss_pad_kp3_plus [last access 4th July 2014]

[2] http://cycling74.com/products/max [last access 4th July 2014]

Figure 5. Four cameras synchronised in one screen for video-analysis.

plicable for a live concert without any loss of plausibility or credibility.

5. LIVE PERFORMANCE

In this section we describe the actual live concert when the purpose-composed song Experimence was first performed publicly and with the audience participation.

This central element of the whole study happened at the music festival "Wiener Musik-Experimente" (Viennese Music-Experiments) on 6th February 2014 in Vienna, Austria. This was a good opportunity for us as the main idea behind this event was to interlink mainstream and experimental approaches in live music in various different ways.

5.1 Video Data Collection

We used four cameras to video-record the performance from four different angles. Two cameras were mounted at the front and back to cover the whole room and to focus on the audience. The other two cameras were oriented towards the stage from opposite angles to record the musicians. For the final analysis we synchronised all videos and edited them to fit in one screen as shown as a still picture in Figure 5. The video is also available online [1].

5.2 Performing "Experimence"

Just before the actual performance of Experimence, a short introduction was given to the audience to explain what they could do with the balloon. When the song started, the balloon was held back by a helper in front of the stage until the first interlude. From that moment on it was introduced into the crowd who then bounced it around over the heads of the audience throughout the whole room.

The balloon tracking was activated during each Interlude and its trajectory manually traced by the "wizard" behind the stage. An additional projection on a big screen showed the words "Balloon active", which was intended to support the awareness of the audience when the influence in the music was activated. The balloon was left in the audience throughout the whole song. However, an influence on the sound of the piano was only audible during the instrumental Interludes.

During the live performance, one spontaneous change happened in relation to the song's form. This improvised and mood-driven extension by the pianist can be seen in the live video at 03:28 when the drummer stops playing, puts down the sticks and watches the audience playing the balloon. A few seconds later both the guitarist and the drummer reacted immediately on this prolongation and continued playing. Hence, the final and actual performed version of Experimence had a duration of 4 minutes and 16 seconds, and was nearly 40 seconds longer than anticipated.

We now proceed with a reflection of our experiences and a discussion of the study from a composer and performer point of view.

6. DISCUSSION

The subject of this study was the composition of a rock song for a live concert and its performance with the inclusion of the audience for an interactive participation. After the analysis of the purpose written song Experimence and a description of the rehearsals as well as the actual live performance at a music festival, we now reflect on the whole process and the outcome.

The first research question asked, what considerations had to be made while composing a rock song following certain standards according to song writing conventions, and at the same time keeping in mind the partly unpredictable behaviour of the participating audience.

First of all, the actual intervention for audience participation, in our case the movement of the balloon, played an important role throughout the whole creative process. Hence, the given technical and data-related possibilities and constraints can be seen as a basis on which different decisions are made. In our particular case for example, it was the trajectory of the balloon that was used to get real-time data. The three values representing the three dimensions were clearly defined in terms of their range and occurrence. However, the trajectory itself was more or less unpredictable, especially when thinking of different extreme scenarios such as bouncing the balloon very high or keeping it low.

Comparing the initial and the final song structure of Experimence, the form and single parts changed several times throughout the whole process. During the composition these alterations were mostly made deliberately. At the live performance however a spontaneous repetition at the end of the song happened in a mood-driven way. The actual consideration in the end was to leave certain gaps and unfinished parts in the composition which could later be closed and completed by the audience. Finally four instrumental Interludes were created with the intention of letting the sound be collaboratively modulated by the crowd.

After all what the audience did was rather real-time sound modulation of given tones than actual improvisation. However, it is the spontaneity and unpredictability of such an influence that is referred to as improvisation in this particular context. Furthermore, the reflection on the whole process we went through during the composition, the rehearsals and the performance indicates an important trade-off: to provide enough freedom for unpredictable behaviour

as well as distinct feedback for the involved audience and keeping the amount of improvisation at an appropriate level considering the characteristics of a rock song. As evidenced by the spontaneous insertion of another Interlude and Chorus, the clear modular Verse-Chorus-Interlude structure helped the band to react immediately on this modification and correctly communicate it among all musicians.

Another important consideration addresses the actual influence. With Experimence, the final decision of which particular influence the audience will have during the performance was the sound of the piano. However, during the rehearsals the ideas varied from applying the modulation during the whole song to letting the audience play the actual notes of the Interlude's melody. From a song writing perspective applying effects addresses the sound and arrangement while changing notes result in a modified melody. Both approaches are considerable interventions in the song but diverse in terms of their actual influence.

Finally, there is the actual instrument, that is influenced by the audience, which is the piano in the case of Experimence and it was chosen at a very early and conceptual stage of the composition. The decisive reasons in our case were, that the piano is the lead instrument in the song, and that its sound is very distinctive and familiar in general which makes it easier to recognise when it is modulated by effects.

6.1 Drawing out Variables of Consideration

After this analytic summary of the most notable aspects we observed during the composition, rehearsals and the live performance of the song Experimence, we revisit our second research question. This asks for a more general classification of considerations that influence and shape the composition of a rock song for interactive audience participation. An attempt to generalise our experience leads to the following abstract *variables of consideration*:

The **subject of influence** is either an instrument or something which creates the music to some extent. It is the crucial point and defines further possibilities regarding to the actual influence. Hence, the following questions are important for this choice: (1) What is it? (2) Who plays it? and (3) How is it played?

The **degree of influence** describes what intervention happens to the music in particular and to what extent this is intended. This choice is dependent on the chosen subject of influence and the questions: (1) What is possible? and (2) What is wanted?

The **degree of improvisation** is the amount of participation that is granted to the influencing audience. This addresses the occurrence in terms of the time and quantity regarding to the whole song. The questions in this case are: (1) When, (2) where and (3) how long does the influence happen?

The **degree of uncertainty** is mostly dependent on the intervention itself and the ways an audience is actually influencing the performance from an interaction point of view. It describes the anticipated behaviour of the crowd, the circumstances and the scope of action it has from a technical viewpoint which leads to the questions: (1) How does it work? (2) Which data is available? and (3) How predictable is the influence?

To summarise, we have presented four variables of consideration when composing a song following popular music characteristics and at the same time keeping in mind interactive audience participation. As these results are based on the observation and reflection of our own particular case study, we do not claim these to be complete in this regard but rather see them as a starting point for further discussion.

Finally, it is important to mention, that these variables of consideration affect each other and differ in their peculiarity as they are all dependent on the actual intervention for including the audience in the performance.

7. CONCLUSION

In this paper, we presented the song Experimence which was composed for a particular live performance including the audience for interactive participation. From an interaction point of view this was achieved by letting the crowd control a balloon collaboratively to shape the sound of the piano at certain parts of the song.

The underlying research questions address aspects that have to be considered when composing a song under the limiting circumstances of popular music and interactive audience participation. Additionally, a more abstract classification of these characteristics, that influence the creative process of song writing, were subject of this elaboration.

By observation, reflection and discussion of the whole process of composing, rehearsing and performing the song Experimence, we identified and present a set of four abstract variables of consideration which are (1) subject of influence, (2) degree of influence, (3) degree of improvisation, and (4) degree of uncertainty. These variables describe the questions that drive certain decisions during the composition of a rock song for an interactive inclusion of the audience.

In addition to the song Experimence itself and the identified variables of consideration, another contribution is the intervention used for including the audience in the live performance as proof of concept. This opens various directions for future research as pointed out in the following last chapter.

8. OUTLOOK

A particular musical progression of the song Experimence was already considered during the rehearsals. This possible influence of the audience, described in chapter 4.3, by controlling actual notes of a melody collaboratively would lead to different aesthetic results presumably compared to the approach of this study to let them modulate the sound.

Furthermore, even other elements but music such as visuals may be subject to audience participation. This would most certainly lead to different possibilities and degrees of influence.

Also the interventions itself could be extended by using more than one balloon for example. These can appear in

different colours for different music features to be used at once or alternatively throughout the song.

Finally, focusing on the audience's interaction and tendencies in the behaviour might be subject to future evaluation. A reflection of these insights with the music and the band, may reveal new aspects of interactive audience participation such as collaborative learning effects among the audience or new ways of communication between spectators and musicians.

Acknowledgments

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